99A-105

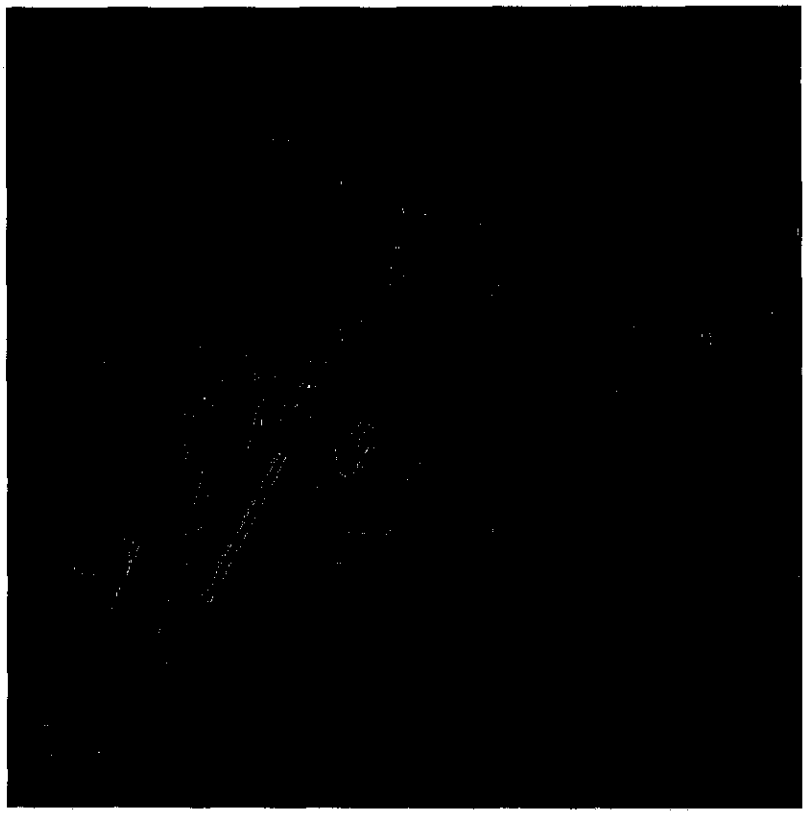
TCCA

Tehama-Colusa Canal Authority

Proposal for the
CALFED Bay-Delta Program

Fish Passage Improvement Project at the Red Bluff Diversion Dam

Phase II



April 1999

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4.5 PSP Cover Sheet (Attach to the front of each proposal)

Proposal Title: **Fish Passage Improvement Project at the Red Bluff Diversion Dam, Phase II**
Applicant Name: **Tehama-Colusa Canal Authority**
Mailing Address: **P.O. Box 1025, Willows, CA 95988**
Telephone: **(530) 934-2125**
Fax: **(530) 934-2355**
Email: **Tcwaterman@aol.com**

Amount of funding requested: **$2,574,000** for **2** Years

Indicate the Topic for which you are applying (check only one box).

- ☒ **Fish Passage/Fish Screens**
- ☐ Habitat Restoration
- ☐ Local Watershed Stewardship
- ☐ Water Quality
- ☐ Introduced Species
- ☐ Fish Management/Hatchery
- ☐ Environmental Education

Does the proposal address a specified Focused Action? **X** **yes** ____ no

What county or counties is the project located in? **Tehama**

Indicate the geographic area of your proposal (check only one box):

- ☒ **Sacramento River Mainstem**
- ☐ Sacramento Trib: _____
- ☐ San Joaquin River Mainstem
- ☐ San Joaquin Trib: _____
- ☐ Delta: _____
- ☐ East Side Trib: _____
- ☐ Suisun Marsh and Bay
- ☐ North Bay/South Bay: _____
- ☐ Landscape (entire Bay-Delta watershed)
- ☐ Other: _____

Indicate the primary species which the proposal addresses (check all that apply):

- ☐ San Joaquin and East-side Delta tributaries fall-run chinook salmon
- ☒ **Winter-run chinook salmon**
- ☒ **Late-fall run chinook salmon**
- ☐ Delta Smelt
- ☒ **Splittail**
- ☒ **Green sturgeon**
- ☐ Migratory birds
- ☐ Other: _____
- ☒ **Spring-run chinook salmon**
- ☒ **Fall-run chinook salmon**
- ☐ Longfin smelt
- ☒ **Steelhead trout**
- ☐ Striped Bass
- ☒ **All chinook species**
- ☒ **All anadromous salmonids**

Specify the ERP strategic objective and target(s) that the project addresses. Include page numbers from January 1999 version of the ERP Volume I and II:
Objective: Dam and Other Structures; Target 1: "Minimize survival problems for adult and juvenile anadromous fish at RBDD by permanently raising the gates during the non-irrigation season and improving passage facilities during the irrigation season" (ERP, Volume II, Page 190).

I-013000

Indicate the type of applicant (check only one box):

- ☐ State agency
- ☐ Federal agency
- ☐ Public/Non-profit joint venture
- ☐ Non-profit
- ☒ **Local government/district**
- ☐ Private party
- ☐ University
- ☐ Other: _____

Indicate the type of project (check only one box):

- ☐ Planning
- ☒ **Implementation**
- ☐ Monitoring
- ☐ Education
- ☐ Research

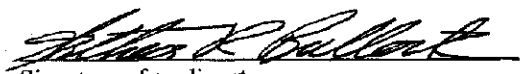
By signing below, the applicant declares the following:

1.) The truthfulness of all representations in their proposal;

2.) The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and

3.) The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Arthur R. Bullock, General Manager
Printed name of applicant


Signature of applicant

I-013001

Title Page

Title of Project

Fish Passage Improvement Project at the Red Bluff Diversion Dam, Phase II

Primary Contact

Mr. Arthur R. Bullock, General Manager
Tehama-Colusa Canal Authority
P.O. Box 1025
Willows, California 95988
Phone: 530/934-2125 **Fax:** 530/934-2355
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Participants and Collaborators

U.S. Bureau of Reclamation, California Department of Water Resources, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and California Department of Fish and Game.

Type of Organization and Tax Status

Non-profit Public Agency

Tax Identification Number

68-0139216

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Executive Summary

Project Size and Location

The project is located on the main stem of the Sacramento River at the upper end of the Butte and Colusa Basin Watersheds in Tehama County. Figure 1 shows the Red Bluff Diversion Dam (RBDD) and the current Tehama-Colusa Canal Authority (TCCA) intake site. Figure 2 shows the TCCA service area and the reach of the Sacramento River being investigated for potential pump station sites.

Project Description and Primary Biological/Ecological Objectives

This proposal is for Phase II of a project that involves modifying the RBDD or its operations to reduce or minimize the impacts of the RBDD on upstream and downstream migration of juvenile and adult anadromous fish, while improving the reliability of agricultural water supply. The potential alternatives range from developing a completely new screened intake to the Tehama-Colusa (T-C) and Corning canals (Canals) and entirely eliminating the need for the RBDD for agricultural irrigation to devising a new operating schedule for the RBDD, incorporating existing pumping facilities, and constructing minor additional facilities, or a combination of these elements. Phase I, partly funded by a 1998 CALFED Category III grant and currently in progress, is a feasibility study to preliminarily identify alternative facility operations and sites, land requirements and ownership, environmental and other regulatory requirements, design criteria, costs, and potential funding sources to implement the project.

Phase II will include preliminary design for alternatives identified, screened, and found feasible in Phase I; environmental review; and completion of an implementation plan. The environmental review will be conducted on several feasible alternatives to meet both National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) requirements. The implementation plan begun in Phase I will be expanded, refined, and finalized as the location, configuration, scope, and cost of the project becomes more clearly defined. The implementation plan will address financing, construction scheduling, and permitting requirements and will include a monitoring plan.

The primary biological/ecological objectives of the project are to reduce or minimize the impacts of the RBDD on upstream and downstream juvenile and adult anadromous fish migration. The RBDD, as it currently operates, is a barrier to anadromous fish migration from May 15 through September 15 when its gates are closed and obstruct normal river flows. Reducing or eliminating the current dependence on the RBDD for agricultural irrigation supply would enable RBDD operations to be modified to improve fish passage for all adult and juvenile anadromous fish.

Project Cost

The amount requested from CALFED is $2,574,000. The TCCA would administer the project with input from resource agency staff who are involved with RBDD fish passage issues. These agencies, which have representatives on the Red Bluff Fish Passage Study Management Group (SMG), include Reclamation, USFWS, NMFS, CDFG, DWR, and TCCA. These entities will participate as part of their funded, ongoing efforts. These costs are not included in the amount requested from CALFED for Phase II. TCCA's costs to administer Phase II of the project, $139,000, are included in Table 2b of this proposal to show total estimated project cost. However, TCCA will bear these administrative costs, and these costs also are not included in the amount requested from CALFED.

Adverse and Third Party Impacts

Third party impacts might occur due to project implementation. Potential project environmental and socioeconomic impacts would be mitigated under NEPA and CEQA requirements to the extent feasible. Third parties also might realize significant project benefits, as described below.

Applicant Qualifications

The TCCA is a joint powers authority formed approximately 12 years ago to improve maintenance procedures on the T-C and Corning canals. TCCA, with a staff of 22 full-time employees, currently operates and maintains 140 miles of canals, mostly concrete-lined, with an annual budget of more than $2 million. TCCA has significant experience administering water supply capital improvement projects. TCCA partners with Reclamation in operating the RBDD and addressing associated fisheries issues. TCCA participates in public forums and technical groups doing RBDD fisheries research and makes significant financial and technical contributions to such efforts. Through its Joint Powers Agreement, TCCA has the authority to acquire, construct, manage, maintain, and operate major facilities.

Monitoring and Data Evaluation

This proposal outlines a monitoring program that will be further developed in this phase and implemented with the proposed project. It identifies hypotheses regarding fish passage at the RBDD, biological/ecological objectives, monitoring parameters and data collection approach, and data evaluation approach. The monitoring program incorporates existing RBDD fish passage data and will use ongoing monitoring data to evaluate the effectiveness of the project in improving fish passage at this locality.

Local Support/Coordination with other Programs/Compatibility with CALFED Objectives

This project was authorized by the unanimous vote of the TCCA Board of Directors on May 12, 1998. TCCA member districts serve agricultural areas in Tehama, Glenn, Colusa, and Yolo counties. The proposed project has the interest and support of the Red Bluff Fish Passage SMG, which will be given periodic progress reports, along with requests to review and provide information, as appropriate. Agencies that have expressed support for the project goals and objectives and indicated a desire to participate in the project's development include Reclamation, USFWS, NMFS, CDFG, and DWR.

The proposed project is compatible with the CALFED Bay-Delta Program, Biological Opinion for Operation of the RBDD, RBDD Research Pumping Plant evaluation project, RBDD Long-term Fish Passage Program, Draft Winter-run Salmon Recovery Plan, Central Valley Project Improvement Act (CVPIA) through the Anadromous Fish Restoration Program (AFRP), and the California Salmon, Steelhead Trout and Anadromous Fisheries Program Act of 1988.

The project also is compatible with CALFED ecological restoration targets and programmatic actions identified for "Dams and Other Structures" in CALFED's February 1999 ERP, Volume 2, page 190. Specifically, this project addresses Target 1: "Minimize survival problems for adult and juvenile anadromous fish at RBDD by permanently raising the gates during the non-irrigation season and improving passage facilities during the irrigation season" and Programmatic Action 1A: "Upgrade fish passage facilities at the RBDD." The project supports the CALFED non-ecological objective of providing a more reliable water supply for agriculture and other beneficial uses, such as wildlife refuges.

Project Description

Project Description and Approach

The RBDD gates enable Sacramento River water to flow into the TCCA canal headworks by gravity. However, the RBDD is permitted to operate with the gates down only from May 15 to September 15 to allow for seasonal fish migration during the other 8 months. This 4-month period is not sufficient to meet the irrigation requirements of TCCA's member districts and their customers. The purposes of this project are to 1) improve fish passage at the Red Bluff Diversion Dam by reducing or eliminating TCCA's influence on RBDD operations and 2) enhance the reliability of TCCA's water supply during the spring and fall periods. The range of approaches to achieving these purposes includes developing a completely new screened intake to the Canals and entirely eliminating the need for the RBDD for agricultural irrigation to devising a new operating schedule for the RBDD, incorporating existing pumping facilities, and constructing minor additional facilities, or a combination of these elements.

Proposed Scope of Work for Phase II

Phase II consists of the following principal tasks: preliminary design of feasible alternatives, evaluate alternatives, screen alternatives, complete environmental documentation, initiate permitting, refine the project implementation plan, and project management. Following is a description of these tasks and the activities that they will include.

Task 1, Preliminary Design of Feasible Alternatives

This task will build on the current Phase I feasibility study, which was partly funded by a previous Category III grant. It will include more detailed development of potential alternatives that are being identified in conjunction with the affected state and federal regulatory agencies. Information to be developed under this task includes the location, type, and configuration of facilities associated with each alternative. Such facilities may include dams and diversion structures, fish ladders, pumps, fish screens, and existing facilities. Activities associated with developing each alternative will include airphoto mapping, site investigations to identify site-specific constraints, hydraulic evaluations, preliminary environmental screening, and identifying right-of-way and permitting requirements. Basic layouts of the facilities to be included in each alternative will be developed, and order-of-magnitude construction and operations and maintenance cost estimates will be prepared. This information will be summarized in a technical memorandum for each alternative. At the conclusion of this task, screening criteria will be developed in conjunction with the affected regulatory agencies to assist in evaluating the alternatives in Task 2. The screening criteria will focus on achieving fish passage improvements. Other screening criteria will be evaluated under Task 2.

Deliverables: Technical memoranda describing each alternative.

Task 2, Evaluate Alternatives

This task will involve a preliminary evaluation of alternatives to be performed in conjunction with the affected regulatory agencies. The evaluation will focus on the potential of each alternative to meet the applicable fish passage criteria established by the agencies. The preliminary designs defined in Task 1

will be refined as necessary to optimize achievement of the fish passage criteria prior to beginning the detailed screening of alternatives in Task 3.

Deliverables: Alternatives Evaluation Technical Memorandum.

Task 3, Screen Alternatives

The alternatives will be screened in conjunction with the affected agencies, using the preliminary design information and facility layouts developed previously. The initial step will consist of developing factors to be evaluated in the screening process. These factors will include fish passage improvement, water supply reliability improvement, socioeconomic issues, environmental and permitting issues, cost (including capital and operations and maintenance costs), consistency with other agency initiatives, and others. Each factor will be assigned a relative weight, and point values will be assigned for each alternative to reflect the relative advantages and disadvantages of each alternative. Relative weighting and point values will be assigned in a workshop setting, and the ratings and screening process will be reviewed with the affected agencies to ensure that concurrence is achieved on the alternatives that are screened out as well as those to be carried forward.

It is anticipated that several workshops will be held to obtain input from stakeholders and resource agencies in developing the recommended course of actions.

Deliverables: Workshop presentation materials describing alternatives, screening criteria, and screening results; these results will, in turn, be incorporated into the NEPA/CEQA process.

Task 4, Environmental Documentation

Environmental documentation will be prepared as a part of the alternative screening process. The environmental document will meet the requirements of CEQA and NEPA and address the impacts and benefits of each alternative developed in the preliminary design task. It is recommended that only those alternatives that survive the screening process be analyzed in detail, while limiting the discussion of other potential alternatives to a section summarizing reasons for their dismissal. Given the potentially significant impacts associated with some of the probable alternatives and concerns with recreational and socioeconomic effects associated with Lake Red Bluff, it is assumed that the appropriate document will be a joint Environmental Impact Statement/Report (EIS/EIR). Where significant potential impacts are identified, appropriate mitigation measures will be identified. Activities are expected to include:

- Public scoping
- Prepare administrative draft document, coordinating closely with pre-design effort
- Prepare public draft document
- Respond to public comments/prepare final document
- Prepare findings/decision documents

Task 4 will provide (1) a detailed analysis of the relative merits and disadvantages of the preferred alternative and other project alternatives; (2) a formal mechanism for disseminating public information about the project and for public participation in the decisionmaking process; and (3) a Record of Decision in which the lead agencies formally identify and endorse the preferred alternative or another alternative and its impact mitigation measures to be carried forward. Once the Record of Decision is adopted, final design can be initiated and permit acquisition activities can be finalized. It is anticipated that either Reclamation or the USFWS will be the lead agency under NEPA and that the TCCA will be the lead agency under CEQA.

Deliverables: Administrative, public, and final EIS/EIR.

Task 5, Permit Initiation

Once the preferred alternative has been selected, permitting efforts will be initiated with the appropriate agencies. Permits and approvals may be required by the following agencies:

- U.S. Army Corps of Engineers (404/Section 10 Permit)
- CDFG (Streambed Alteration Agreement/CESA compliance)
- NMFS (ESA compliance)
- USFWS (ESA compliance)
- State Lands Commission (Lease Across State Submerged Lands)
- Regional Water Quality Control Board (Waste Discharge Requirements/Stormwater)
- State Reclamation Board (Encroachment Permit)
- City of Red Bluff and Tehama County (conditional use permit)
- Federal Emergency Management Agency (Letter of Map Revision – floodplain encroachment)

It is anticipated that this task will include 5 to 10 coordination meetings with agency personnel. This task will also overlap with ongoing efforts in Phase I, which are focused on preliminary contacts with all agencies listed above and identifying key contacts and processing timeframes.

Deliverables: Permit application documentation.

Task 6, Implementation Plan Refinement

An implementation plan will be developed for the preferred alternative. The preliminary implementation plan developed in Phase I will serve as the starting point for the plan. The implementation plan will include potential financing mechanisms, an implementation schedule, permitting information and responsibilities, and the project monitoring and data evaluation plan.

Deliverable: Project Implementation Plan.

Task 7, Project Management

The project management task includes developing project instructions, work plan, schedule, staff resource plan, and budgets; monitoring the schedule, expenditures, and work progress; invoicing for work completed; project status reports; and ongoing communications with participating agencies.

Deliverables: Work plan, including project instructions, schedule, staff resource plan and budgets; quarterly progress reports and final report to CALFED agencies as specified on page 34 of the PSP.

The NEPA/CEQA process, Task 4, may be deferred to a subsequent funding cycle, but this will delay implementation of the solution. Without this solution, the benefits of other current or future restoration activities in the Sacramento River/Delta cannot be maximized.

Location/Geographic Boundaries of the Project

The project is located on the main stem of the Sacramento River in Tehama County and will have a positive effect on anadromous fish restoration throughout the Sacramento River Watershed. Figure 1 shows the RBDD and the current TCCA intake site. Figure 2 shows the reach of the Sacramento River being investigated for potential pump station sites. Figure 3 shows the project schedule.

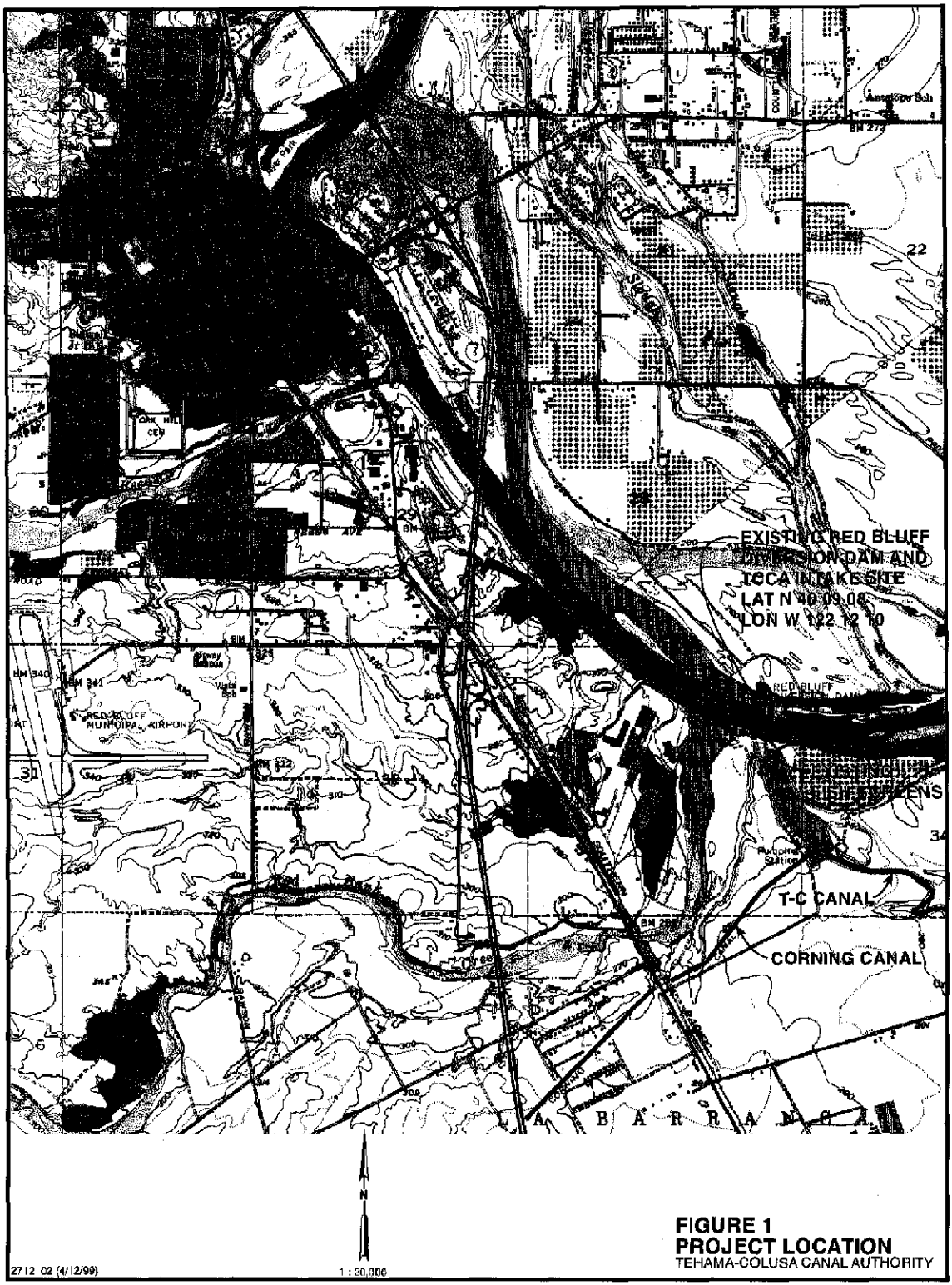

FIGURE 1
PROJECT LOCATION
TEHAMA-COLUSA CANAL AUTHORITY

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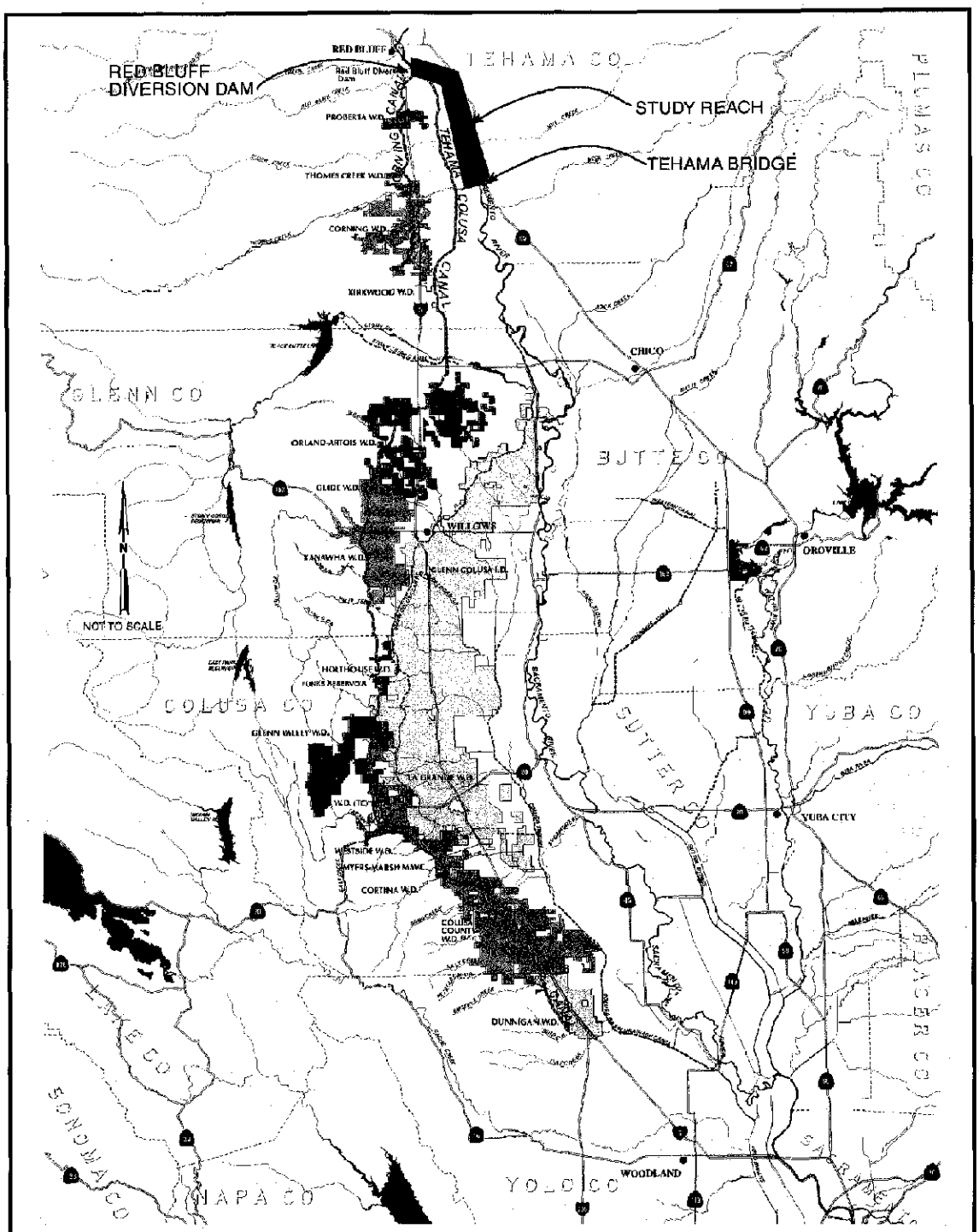

FIGURE 2
TEHAMA-COLUSA CANAL AUTHORITY AND DISTRICTS SERVED
TEHAMA-COLUSA CANAL AUTHORITY

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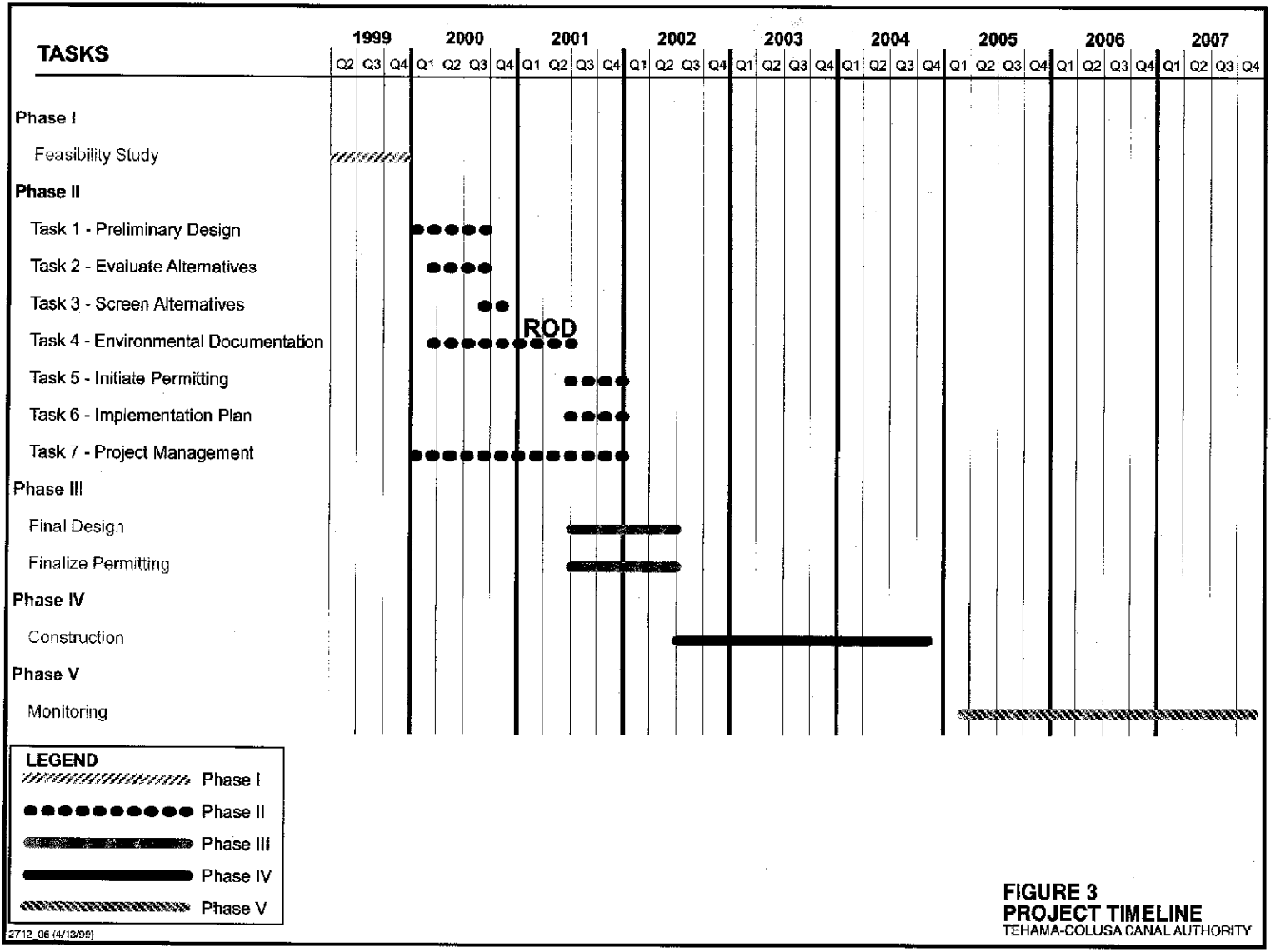

FIGURE 3
PROJECT TIMELINE
TEHAMA-COLUSA CANAL AUTHORITY

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Ecological/Biological Benefits

Ecological/Biological Objectives

The primary biological/ecological objectives of the project are to reduce or minimize the impacts of the RBDD on upstream and downstream juvenile and adult anadromous fish migration. Reducing or eliminating the current dependence on the RBDD for agricultural irrigation supply will allow modified RBDD operations to improve fish passage for spring-run, fall-run, late-fall-run, and winter-run chinook salmon, splittail, sturgeon, and steelhead trout. This could also provide secondary benefits, such as reducing predation that occurs as a result of delays in migration at the RBDD, and better access by migrating salmonids to spawning gravel above the RBDD.

The project is needed to address various agency and legislative mandates and public concerns regarding fish passage issues at the RBDD and to improve the reliability of water deliveries to TCCA's agricultural customers. The project would potentially provide third-party benefits, such as better enabling state and federal agencies to pursue the Stony Creek Enhancement Project and other water management options.

In the Winter-run Salmon Recovery Plan, Objective 2 of Goal II calls for developing and implementing a permanent remedy at RBDD that improves passage for juvenile (and adult) winter-run chinook through the Red Bluff area, while minimizing losses of juveniles at diversion and fish bypass facilities. The proposed project will identify and develop alternatives that have the ability to meet this Goal and Objective. Furthermore, Section 3406(b)(10) of the Central Valley Project Improvement Act requires the Secretary of the Interior to develop and implement measures to minimize fish passage problems for adult and juvenile anadromous fish at the RBDD (NMFS, 1997). The objective of the proposed project is to develop and evaluate measures that would reduce or eliminate the dependence of agricultural irrigation on the operations of RBDD. Stressors that the project addresses are focused on barriers or delays to migration and associated predation at the RBDD. Project facilities, including any screened intakes, will meet all current fisheries agencies' requirements and result in reduced dependence on current RBDD operations to draw water into the TCCA canal system. Species that will benefit within the Keswick to RBDD Ecological Management Unitare listed in the ERP (Volume 2, February 1999, pages 167-168).

The scientific hypothesis to be evaluated through the project is that the proposed project reduces risk of blockage and impedance of upstream and downstream migrating adult and juvenile salmon past the RBDD by reducing or eliminating the dependence of agricultural irrigation water supply on the existing RBDD facilities and operations. This hypothesis, monitoring parameters, data collection approach, and data evaluation approach are discussed in greater detail below in the section "Monitoring and Data Collection Methodology."

During normal years, TCCA requires alternative water supplies during the 8-month period when the RBDD is precluded from operation, especially in the spring prior to May 15. When available, CVP water can be provided from Black Butte Reservoir to the T-C Canal via a diversion in Stony Creek. However, during dry years, when most needed, this supplemental water is least likely to be available. The project would benefit the TCCA by reducing or eliminating shortfalls during dry years that might occur outside the annual period of permitted RBDD operations. The project would not only benefit upstream and downstream migration past RBDD for the anadromous salmonid species, but also American shad, sturgeon, and native resident and migratory species. This would further reduce stress on

those populations from predation, reduce competition for habitat within large areas of the river, and allow the ecosystem in the river to regain a more natural ecological equilibrium. The project would allow an adaptive management strategy to be adopted to develop the long-term operation of RBDD to maximize benefits to aquatic communities in the upper Sacramento River Watershed.

Linkages

The resource agencies have been seeking solutions to fish passage problems at the RBDD for more than 20 years. Other ongoing projects and programs that these efforts, including the currently proposed project, are linked to include CALFED Bay-Delta Program, Biological Opinion for Operation of the RBDD, RBDD Research Pumping Plant testing and evaluation program, RBDD Long-term Fish Passage Program, Draft Winter-run Salmon Recovery Plan, Central Valley Project Improvement Act (CVPIA) through the Anadromous Fish Restoration Program (AFRP), and the California Salmon, Steelhead Trout and Anadromous Fisheries Program Act of 1988. The proposed project will explore the feasibility of incorporating facilities of the RBDD Research Pumping Plant. The Red Bluff Fish Passage Study Management Group, which includes representatives of Reclamation, USFWS, NMFS, CDFG, DWR, and TCCA, will provide project input as part of their funded, ongoing efforts.

This proposal is for Phase II of the ongoing Fish Passage Improvement Project at the Red Bluff Diversion Dam. The project involves operating the Red Bluff Diversion Dam (RBDD) to maximize fish passage while minimizing impacts to agricultural water supply. Phase I, partly funded by a 1998 CALFED Category III grant, is identifying alternative facility sites, land requirements and ownership, environmental and other regulatory requirements, preliminary design criteria, and potential funding sources to implement the project. Phase I also is identifying project alternatives that are compatible with related efforts, including the RBDD Research Pumping Facility testing and evaluation program. Phase II will include preliminary design for alternatives identified, screened, and found feasible in Phase I, environmental documentation, and an implementation plan. The environmental review will meet National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) requirements and will be conducted on all feasible alternatives. The implementation plan begun in Phase I will be expanded, refined, and finalized as the location, configuration, scope, and cost of the project facilities become more clearly defined. The implementation plan will address financing, construction scheduling, and permitting requirements and will include a monitoring plan. At the completion of Phase II, the project will progress to the final design and construction phases.

The project is linked directly to CALFED ecological restoration targets and programmatic actions identified in CALFED's February 1999 ERP, Volume 2, page 190. Specifically, this project will address Target 1: "Minimize survival problems for adult and juvenile anadromous fish at RBDD by permanently raising the gates during the non-irrigation season and improving passage facilities during the irrigation season" and Programmatic Action 1A: "Upgrade fish passage facilities at the RBDD." Additionally, the project supports the CALFED non-ecological objective of providing a more reliable water supply for agriculture and other beneficial uses, such as wildlife refuges. Regarding legal obligations and agency mandates, the project will assist Reclamation in meeting its contractual obligations to supply water to the 17 water districts receiving service from the T-C and Corning Canals.

System-wide Ecosystem Benefits

Volume 2 of the ERP (February 1999, Page 165) states that more than 75 percent of naturally spawning chinook salmon use the Sacramento River reach between the RBDD and Keswick Dam. Correcting fish

passage problems at the RBDD would allow maximum use of available spawning habitat in the upper watershed.

The project is of vital importance to projects already undertaken and is of critical importance as a forerunner to all future Sacramento River fisheries mitigation and enhancement projects. From Shasta Dam to the Delta, tremendous efforts have been made in the past 10 years by the state and federal resource agencies, Reclamation, water diverters, and others to improve habitat, water temperature, and fish passage, with mixed results. Improving upstream and downstream fish passage at the new or modified TCCA diversion facilities will maximize use of fish habitat in the Sacramento River system and indirectly maximize the benefits of both the previously completed and ongoing fish protection projects all along the Sacramento River.

The project will provide more reliable backup supplies to the Glenn-Colusa Irrigation District (GCID) canal system and to the three national wildlife refuges (Sacramento, Delevan, and Colusa) served by GCID. The project could also provide fish flows through the Constant-head Orifice (CHO) on the T-C Canal into Stony Creek

Compatibility with Non-ecosystem Objectives

Along with the multitude of direct ecological benefits of the project, the non-ecosystem benefits of the project, such as greater water supply reliability, will pay ecological dividends. The primary non-ecosystem benefit of the implemented project would be to provide TCCA and its customers with a more flexible and reliable year-round water supply delivery system, thereby improving water management capabilities for all beneficial uses. Additional potential non-ecosystem benefits include:

- Incorporation of RBDD Research Pumping Facility into the proposed project
- Independence from backup water supplies from Black Butte Reservoir in spring, allowing this water to be used for other beneficial purposes, such as groundwater recharge or additional instream flows
- Recharge of local groundwater basins
- Possible supply to future off-stream storage reservoirs

Technical Feasibility and Timing

Other Project Alternatives Evaluated and Reasons for Rejection

In Phase I of the project, currently underway, multiple alternatives for achieving project objectives are being developed. These alternatives will be evaluated and screened during Phase II, proposed herein. Only those alternatives that appear to be feasible after evaluation and screening will be carried forward for detailed analysis in the EIS/EIR to be prepared in Phase II. The EIS/EIR will summarize reasons for rejecting alternatives that do not appear capable of meeting project objectives or that have other "fatal" flaws, such as prohibitive costs, unavoidable adverse environmental or socioeconomic impacts, or irreconcilable land ownership/right-of-way issues.

Environmental Documentation and Permitting Requirements

A single, comprehensive EIS/EIR document that meets the requirements of both NEPA and CEQA will be prepared under this proposal. Environmental issues might include temporary construction impacts (e.g., water quality, riparian and aquatic habitat, noise, channel modification), aesthetic impacts, land use conflicts, socioeconomic effects, public educational and recreational opportunities, and cultural resources.

Phase II work will not require issuance of major permits. However, permit applications will be initiated during this phase. Permits and approvals known or anticipated to be required for the project include Federal Clean Water Act Section 404 Permit, Federal Endangered Species Act Section 7 Consultation, Federal Clean Water Act Section 401 Water Quality Certification, California Fish and Game Streambed Alteration Agreement, National Historic Preservation Act Section 106 Consultation, State Lands Commission Public Agency Lease/Encroachment Permit, State Reclamation Board Encroachment Permit, National Flood Insurance Act Conditional Letters of Map Revision, Use Permit, and Rights-of-Way/ Encroachment Agreements. The implementation plan to be developed under this proposal would verify the permits required for the project and establish a schedule for their procurement. The supporting documentation for these permit applications will be developed during this project phase.

Other Implementation Constraints and Approach to Resolving Them

An objective of this phase is to identify and resolve implementation constraints through development and screening of alternatives and alternative project sites in the context of an ongoing agency and public involvement and consensus building process. Among the anticipated implementation issues are environmental impact mitigation measures, land acquisition, rights-of-way, access to the construction site, and identification of construction staging areas. Project alternatives being identified in project Phase I will be further developed, screened, and evaluated during Phase II, and a preferred alternative will be identified, along with the site on which the project will be constructed. The implementation plan, currently under development in Phase I and to be further refined in Phase II, will address these implementation issues.

Project funding is a potential implementation issue. Potential funding sources and project participants will be identified in the Phase II work.

Monitoring and Data Collection Methodology

Biological/Ecological Objectives

The primary biological/ecological objectives of the project are to reduce or minimize the impacts of the RBDD on juvenile and adult anadromous fish migration. When the RBDD gates are closed from May 15 through September 15, they obstruct upstream and downstream access to anadromous fish. Eliminating the current dependence on the RBDD for agricultural irrigation supply would enable RBDD operations to be modified to optimize fish passage for, and reduce predation of, chinook salmon, steelhead, and other anadromous species. If a new intake to the Canals is included in the preferred alternative, it will be screened to meet all current criteria of the resources agencies.

Monitoring Parameters and Data Collection Approach

To determine optimal operation of the RBDD following the completion of the proposed project, a multi-year, adaptive management approach to monitoring success of RBDD operations should be conducted. As there is an extensive historical record of monitoring both upstream and downstream migration of anadromous fish at RBDD, at a minimum, continuation of the existing monitoring programs should be included. The RBDD adult passage program (escapement estimates) and aerial redd surveys conducted annually by CDFG, and adult video monitoring through the existing ladders at RBDD conducted annually by USWFS, should be continued to document pre- and post-project success in immigration.

USFWS conducts annual monitoring activities, such as survival, abundance, and condition, and seasonal spatial and diel distribution patterns of juvenile salmonids passing RBDD. Additional programs are conducted by the USFWS and CDFG and funded by Reclamation, such as the USFWS' RBDD Research Pumping Plant evaluation program and RBDD Passage Facilities Program for both adult and juvenile salmonid passage and rearing. It is anticipated that these programs will be continued and will document success of the project.

Data Evaluation Approach

It is anticipated that future monitoring programs will be carried out jointly by the USFWS, CDFG, Reclamation, NMFS, and CH2M HILL. Data collected from existing monitoring programs, including hydraulic monitoring, radio-telemetry, video and observational ladder counting, aerial redd counts, carcass surveys, juvenile beach seining and push netting, fyke netting, and screw trapping will be compared to existing data and integrated to develop an overall assessment of the performance of the new intake or modified RBDD facilities in improving upstream and downstream fish passage. Table 1 summarizes the components of the monitoring program, the types of data that will be collected, and the basis for evaluating the data.

Table 1

Monitoring and Data Collection Information

Hypothesis/Question to be Evaluated	Monitoring Parameter(s) and Data Collection Approach	Data Evaluation Approach	Comment/Data Priority
I) Biological/Ecological Objectives: Improve Upstream Fish Passage			
Adult passage through the RBDD will improve with modified operations and/or facilities following the proposed project	Adult aerial spawning surveys; adult counts, video monitoring and radio telemetry surveys to determine spawning distribution, timing and delay of passage through RBDD	Statistically analyze and compare adult passage success, time to pass estimates, and spawning distribution before and after proposed project	Review existing and previous monitoring programs and project objectives to develop strategy for monitoring program
II) Biological/Ecological Objectives: Improve Downstream Fish Passage			
Juvenile and smolt passage through the RBDD will improve with modified operations and/or facilities following the proposed project	Juvenile beach seining, rotary screw trapping, fyke and trap netting upstream and downstream of RBDD to determine success of passage through RBDD	Statistically analyze and compare juvenile, distribution, passage success, time to pass, and survival estimates before and after proposed project	Evaluate and continue historical and existing monitoring programs where appropriate. Evaluate and incorporate project objectives into future monitoring activities

Local Involvement

Local Government Notification

The County of Tehama and the City of Red Bluff were informed of the project in writing. The joint letter of notification is attached.

Local Interest Group Awareness

This project was initially authorized unanimously by the TCCA member districts on May 12, 1998. Phase II was unanimously approved on March 3, 1999. The TCCA represents 17 districts serving property owners of 150,000 acres in four counties. Participation of other local interests will be solicited through the public outreach plan.

Affected Parties Awareness

A resource agency workshop was held in Phase I to review the goals of the project. Future workshops are anticipated in Phase II. All participating agencies, Reclamation, USFWS, CDFG, DWR, and NMFS, expressed support for project goals and a willingness to work with TCCA to develop a solution.

Public Outreach Plan

Affected and interested parties will be notified through the local media, as well as through the public notification and involvement requirements of NEPA and CEQA. A variety of public notification media, such as a project web page, will be considered. As described under Task 3, identification of potential alternatives and selection of a preferred alternative(s) will involve stakeholders' meetings intended to achieve consensus on a preferred alternative. The project team charter will focus on building a consensus among the key interested parties, recognizing that there are a number of perspectives on how fish passage should be improved. Also pursuant to NEPA and CEQA requirements, the public will have ample opportunity to provide scoping input and review and comment on the EIS/EIR, which will describe the project in detail.

Potential Third Party Impacts/Benefits

Third party impacts might occur due to project implementation. Unavoidable adverse environmental and socioeconomic impacts will be mitigated under NEPA and CEQA requirements to the extent feasible. Third parties also might realize significant project benefits, as described below.

Because the project will provide a more reliable water supply for agriculture and other beneficial uses, including wildlife refuge water supplies, the project will benefit water users in Tehama, Glenn, Colusa, and Yolo counties who receive their water from the TCCA and member districts. The project will benefit the northern Sacramento Valley area economy, which depends on agriculture. By reducing dependence on the RBDD, the project will allow agencies to modify RBDD operations to make them more "fish-friendly." A new fish screen that meets all current agency criteria would be constructed for any new intake pumping station. All parties interested in anadromous fish restoration in the Sacramento River/Delta will benefit. The project could enable state and federal agencies to pursue stream enhancement projects and other water management options in the northern Sacramento Valley.

Tehama-Colusa Canal Authority

5513 Highway 162
P.O. Box 1025
Willows, CA 95988

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Fax: (530) 934-2355
Email: tcwaterman@aol.com

April 2, 1999

Red Bluff City Council
City Hall
P.O. Box 400
Red Bluff, CA 96080

Tehama County Board of Supervisors
County Courthouse
P.O. Box 250
Red Bluff, CA 96080

Re: TCCA Study at the Red Bluff Diversion Dam

Ladies and Gentlemen:

Because of fish passage problems, the Tehama-Colusa Canal Authority (TCCA) has watched the reliability of it's water supply from the Red Bluff Diversion Dam fade into annual uncertainty. A decade ago the dam gates were in the Sacramento River year around and water flowed into the Tehama-Colusa and the Corning Canals whenever it was needed. Today the gates are in the River only 4 months out of the year and water needed by our 17 water districts at any other time of the year must be pumped through a system of temporary and experimental pumps which can, at best, deliver only 40% of the water we need. Shortages and restricted deliveries are now common and create extreme hardships on our farmers. To make the situation worse, there are currently two separate proposals being advanced by the resources agencies to keep the dam gates out for an additional 45 days in Spring and 15 days in the Fall to further enhance fish passage by the dam. If implemented, this would result in only 2 months of "gates in" operation each year and would devastate our entire 150,000 acre service area.

In an effort to increase the reliability of the water delivery system into the two Canals, the TCCA applied for and received grant funding from CALFED to conduct a Feasibility Study of methods under which we could reduce our reliance on the Red Bluff Diversion Dam (in its present operation) for water delivery and, correspondingly, enhance fish passage at the dam. This Study is currently underway and should be completed by the end of this year.

I-013018

The TCCA is now preparing an application for CALFED funding to move our feasibility study to the next level - that being Preliminary Engineering Design of the feasible alternatives and Environmental Review and Documentation. We recognize that the solutions we develop for the fish passage and water supply reliability problems at the Red Bluff Diversion Dam may have impacts for the City of Red Bluff and Tehama County. We plan to include the City and County in upcoming meetings and workshops concerning our Study and look forward to working together.

In the meantime, we would be pleased to meet with your representatives to discuss our Study and any concerns or suggestions you may have to accomplishing our goals of enhanced fish passage and improved water supply reliability. To arrange such a meeting, please contact Art Bullock, our General Manager, at the letterhead address or by phone at (530) 934-2125.

Sincerely,

Robert Harper, Chairman
TCCA Board of Directors

CC: City of Red Bluff Planning Department
Tehama County Planning Department

I-013019

Cost

Budget

Table 2a below shows total funding requested from CALFED under Category III by task for project Phase II. Table 2b shows the total project cost by task, which includes TCCA's Phase II cost-sharing contribution to administer the project. Table 3 shows how these costs will be distributed over each quarter for the duration of project Phase II.

Schedule

A project schedule is shown on Figure 3, with Phase II emphasized. This schedule assumes a start of Phase II at the completion of Phase I, about January 2000. The EIS/EIR would result in a Record of Decision in the middle of year 2001, enabling permitting and implementation plan development to proceed to completion. The tasks and the schedule were developed to allow an orderly and cost-efficient progression for site selection and concept development. A description of the tasks identified in the schedule is provided under the section "Proposed Scope of Work for Phase II."

Table 2a

Fish Passage Improvement Project at Red Bluff Diversion Dam—Phase II

Budget Breakdown - CALFED FUNDS ONLY

Task	Direct Labor Hours	Direct Salary and Benefits	Service Contracts	Material and Acquisition Costs	Miscellaneous and other Direct Costs	Overhead and Indirect Costs	Total Costs
Task 1	0	$ -	$ 950,000	$ -	$	$ -	$ 950,000
Task 2	0	$ -	$ 30,000	$ -	$	$ -	$ 30,000
Task 3	0	$ -	$ 20,000	$ -	$	$ -	$ 20,000
Task 4	0	$ -	$ 1,200,000	$ -	$	$ -	$ 1,200,000
Task 5	0	$ -	$ 100,000	$ -	$	$ -	$ 100,000
Task 6	0	$ -	$ 40,000	$ -	$	$ -	$ 40,000
Task 7	0	$ -	$ 234,000	$ -	$	$ -	$ 234,000
Totals		$ -	$ 2,574,000	$ -	$ -	$ -	$ 2,574,000

Table 2b

Fish Passage Improvement Project at Red Bluff Diversion Dam—Phase II

Budget Breakdown - CALFED and TCCA Cost Share Funding

Task	CALFED FUNDED Service Contracts	TCCA Cost Share Funding						Total CALFED and TCCA Cost Share
		Direct Labor Hours	Direct and Salary Benefits	Material and Acquisition Costs	Miscellaneous and other Direct Costs	Overhead and Indirect Costs	SubTotal TCCA Cost Share	
Task 1	$ 950,000	1,000	$ 30,000	$ -	$ 1,200	$ 3,000	$ 34,200	$ 984,200
Task 2	$ 30,000	40	$ 2,000	$ -	$ 200	$ 200	$ 2,400	$ 32,400
Task 3	$ 20,000	40	$ 2,000	$ -	$ 100	$ 200	$ 2,300	$ 22,300
Task 4	$ 1,200,000	1,200	$ 60,000	$ -	$ 1,500	$ 6,000	$ 69,500	$ 1,269,500
Task 5	$ 100,000	40	$ 2,000	$ -	$ 400	$ 200	$ 2,600	$ 102,600
Task 6	$ 40,000	80	$ 4,000	$ -	$ 100	$ 400	$ 4,500	$ 44,500
Task 7	$ 234,000	400	$ 20,000	$ -	$ 4,500	$ 2,000	$ 26,500	$ 257,500
Totals	$ 2,574,000	2,400	$ 120,000	$ -	$ 7,000	$ 12,000	$ 139,000	$ 2,713,000

Table 3

Fish Passage Improvement Project at Red Bluff Diversion Dam—Phase II

Cost Breakdown by Quarter - CALFED FUNDS ONLY

Task	1st - 2000	2nd - 2000	3rd - 2000	4th - 2000	1st - 2001	2nd - 2001	3rd - 2001	4th - 2001	Total
Task 1	$ 316,667	$ 316,667	$ 316,667						$ 950,000
Task 2		$ 15,000	$ 15,000						$ 30,000
Task 3			$ 10,000	$ 10,000					$ 20,000
Task 4		$ 240,000	$ 240,000	$ 240,000	$ 240,000	$ 240,000			$ 1,200,000
Task 5							$ 50,000	$ 50,000	$ 100,000
Task 6							$ 20,000	$ 20,000	$ 40,000
Task 7	$ 29,250	$ 29,250	$ 29,250	$ 29,250	$ 29,250	$ 29,250	$ 29,250	$ 29,250	$ 234,000
Totals	$ 345,917	$ 600,917	$ 610,917	$ 279,250	$ 269,250	$ 269,250	$ 99,250	$ 99,250	$ 2,574,000

Cost Sharing

The labor costs associated with TCCA's administration of Phase II of the project, totaling $120,000 as shown in Table 2b, will be assumed by TCCA and are not included in the amount requested from CALFED. These costs, along with associated overhead and materials costs, constitute TCCA's $139,000 direct cost-sharing contribution to the project.

When the project is completed, TCCA will provide operation and maintenance (O&M) services for any new facilities constructed in conjunction with the project. These services will constitute an additional, significant cost-sharing element for TCCA.

The member resource agencies that comprise the SMG have shared in the cost of project-related activities to date and indicated the willingness to continue their participation through subsequent phases of the project. Their participation represents a significant continuing financial contribution to achieving the goals of the project.

It is anticipated that the USFWS and CDFG will continue existing monitoring programs, including hydraulic monitoring, radio-telemetry, video and observational ladder counting, aerial redd counts, carcass surveys, juvenile beach seining and push netting, fyke netting, and screw trapping. These programs will provide critical comparative "before and after" data on the fish passage benefits of the project.

Applicant Qualifications

The TCCA is a joint powers authority of 15 water districts. TCCA has a 25-year Reclamation contract to operate and maintain the Canals with an annual budget of more than $2 million. It delivers more than 250,000 acre-feet per year of water to 150,000 acres. TCCA partners with Reclamation to operate the RBDD and related facilities and to address associated fisheries issues. The TCCA participates in public forums and technical groups on RBDD fisheries research, and has significantly contributed to efforts to resolve RBDD fisheries issues. The TCCA administers research and planning efforts and implements capital improvements for water supply, water delivery, and fisheries.

CH2M HILL, one of the largest U.S. firms providing comprehensive engineering, scientific, economic, and planning expertise for large-scale, complex fishery and water resources projects, has been involved in this project since its inception. TCCA selected CH2M HILL as a subcontractor for its experience in water resources engineering and planning in California and TCCA's positive experience with the firm. CH2M HILL has served Reclamation, DWR, and numerous northern California water and irrigation districts for more than 50 years and has designed many Sacramento River intakes, pump stations, fish screens, and other water resources and fisheries management facilities.

Staff Organization and Key Project Personnel

As shown on Figure 4 below, TCCA General Manager, Art Bullock, will administer the project with the assistance of TCCA staff. The CH2M HILL consultant team will provide engineering, planning, scientific, and economic expertise.

Art Bullock, P.E., TCCA General Manager and Project Administrator

Registered Professional Engineer: California, Nevada, Oregon

Art Bullock has 30 years of experience in the California public water supply industry, holding positions in four separate Southern California water districts. He served as General Manager and Chief Engineer of two of these districts prior to becoming TCCA General Manager in January 1996. Mr. Bullock has extensive experience in report preparation and administering large research and construction projects.

Jan Jennings, TCCA Assistant General Manager, Assistant Project Administrator

Jan Jennings joined the TCCA as its first employee in October 1988, serving first as Controller and later as Manager of Administration and, for the past 4 years, as Assistant General Manager. Ms. Jennings will assist in all aspects of data compilation and collection, as well as report preparation.

Chris Bujalski, TCCA Administrative Technician, Project Assistant

Chris Bujalski joined the TCCA in March 1994 as an Irrigation Systems Operator and was recently reassigned to the Administration Division. While working full time for the TCCA, Mr. Bujalski is completing a degree at California State University, Chico, in Geoscience and Hydrology. Mr. Bujalski will assist in data compilation and other report preparation activities as needed.

Dale Cannon, P.E., Consultant Team Project Manager

B.S., Civil Engineering; Registered Professional Engineer: Oregon

Dale Cannon has more than 32 years of engineering experience in large-scale water resources projects. He has expertise in project design and management, quality control, construction contract administra-

tion, staff direction, client and regulatory agency liaison, capital improvements financing, and grants administration. He recently managed the flood damage assessment and repairs of the Upper Butte Creek levee system for the U.S. Army Corps of Engineers. He is currently developing conceptual designs for U.S. EPA facilities to prevent contaminated wastes from the Iron Mountain Mine Superfund site near Redding from reaching the Sacramento River.

Howard Wilson, P.E., Senior Reviewer

B.S., Civil Engineering;Registered Professional Engineer: California, Nevada, Washington

Howard Wilson, has more than 30 years of experience in agricultural irrigation systems, pumping, and fish protection facilities. He managed the design of a $20 million rehabilitation and upgrade project for Glenn-Colusa Irrigation District (GCID), including a new Sacramento River intake and 3,000-cfs main pump station. He managed feasibility studies, design, and construction of the interim fish screens and design of the permanent screen facilities at the GCID main pump station. He was senior consultant for the Reclamation District 108 800-cfs Wilkins Slough Positive Barrier Fish Screen project.

Mark Oliver, Environmental and Permitting Issues

B.S., Environmental Policy Analysis and Planning

Mark Oliver manages impact studies and permit acquisition for water resources projects. He managed a joint NEPA/CEQA document for a siphon and associated conveyance facilities on Butte Creek, which was funded through the Category III process, for the Western Canal Water District and USFWS. He directed NEPA/CEQA documentation for water conveyance facilities to seven Central Valley wildlife refuges, is managing a joint EIS/EIR to restore the Trinity River fishery for the USFWS, Hoopa Valley Tribe, and Trinity County, and was a senior consultant for the ACID Fish Passage Improvement Project.

John Crowe, P.E., Pump Station Concepts

B.S., Mechanical Engineering;Registered Professional Engineer:California, Alaska

John Crowe has 29 years experience designing structures and mechanical systems in rivers. For the Chalk Bluff Water Treatment Plant in Reno, Nevada, he managed design of the 80-mgd Truckee River pump station, screened intake, 2,700 feet of 48-inch pipeline, and 3,300-hp treated water pump station at the plant. He also managed preliminary design of the M&T Ranch Sacramento River pump station.

Ken Iceman, P.E., Lead Project Engineer/Hydrology/Hydraulics

B.S., Mathematics;M.S., Civil Engineering; Registered Civil Engineer: California

Ken Iceman has more than 27 years of hydrology and hydraulics experience. He managed the hydraulic monitoring program for GCID interim fish screen performance, designed the training wall and bypass channel system, and managed the GCID permanent fish screen and Sacramento River gradient restoration feasibility study. He provided hydraulic modeling, optimized screen hydraulics, and maximized anadromous fish protection for RD-108's Sacramento River positive barrier fish screen.

Bob Gatton, P.E., Fish Screen Design Concepts

M.S., B.S., Civil Engineering;M.S., Systems Management; Registered Professional Engineer: Washington

Bob Gatton specializes in designing fish screening, passage, and hatchery facilities. He is a design consultant for the GCID and RD-108 fish screening facilities on the Sacramento River. For the Rocky Reach Dam and Hydroelectric Facility on the Columbia River, he managed conceptual design, layout, equipment selection, and agency coordination for the construction 2,000 cfs and 5,000 cfs ganged screens and other fish protection facilities to pass more than 1 million fish around the dam, meeting a 10-week construction schedule to avoid disrupting fish outmigration and power service.

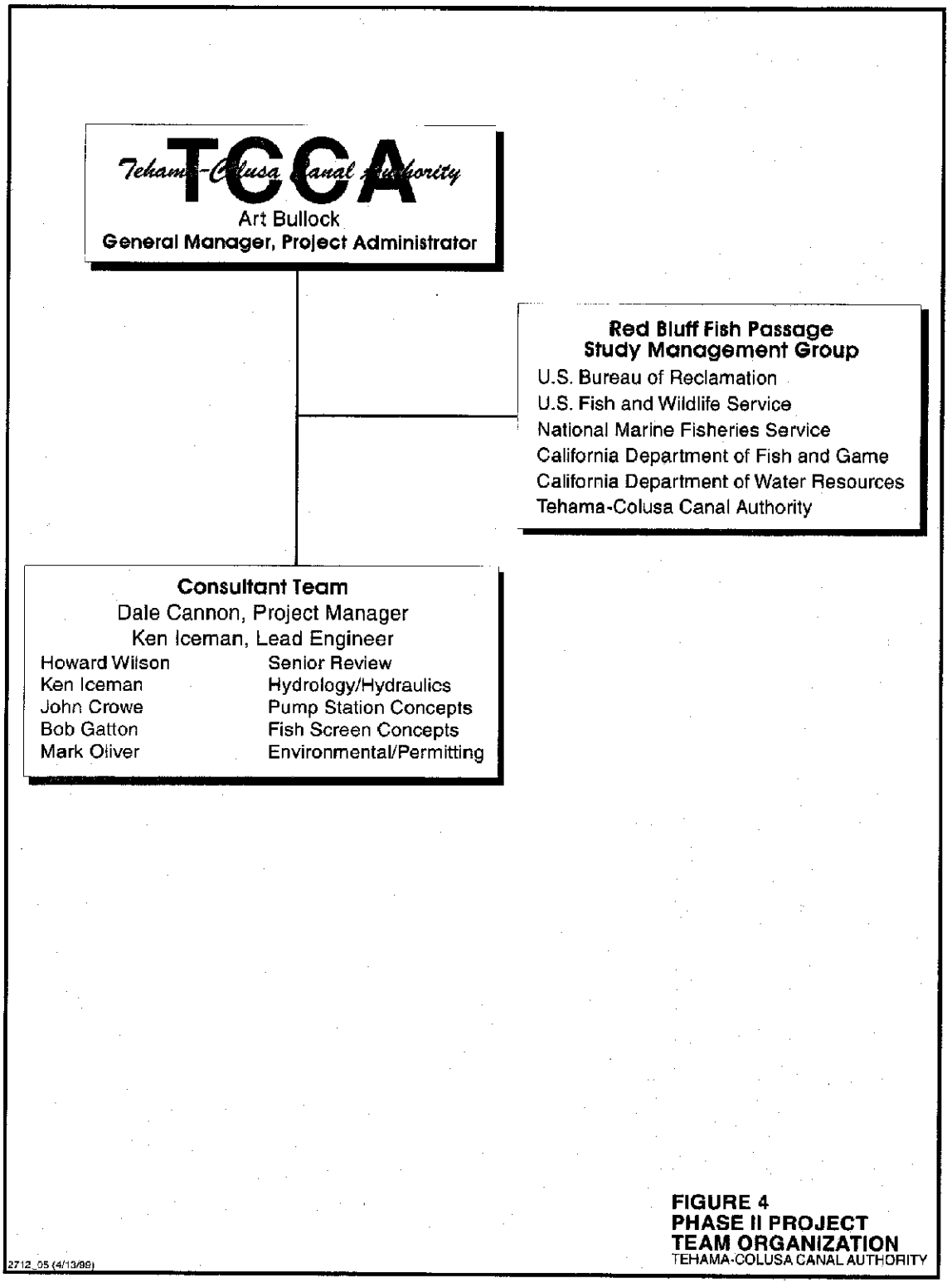

FIGURE 4
PHASE II PROJECT
TEAM ORGANIZATION
TEHAMA-COLUSA CANAL AUTHORITY

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